occurred. The median range of the hospital stay after tracheotomy was six to seven days. With the protocol of treatment as seen in a setting such as Childrens Hospital of Los Angeles, tracheotomy is a safe method of treatment of the airway problem associated with epiglottitis.

Cantrell and co-workers reviewed 740 cases of epiglottitis recorded in the literature. Of these, 348 (46.5 percent) were treated with tracheotomy, 216 (28.8 percent) with intubation and 214 (24.7 percent) with observation. The highest mortality rate (6.1 percent) occurred in the group of patients treated with observation. Mortality in the tracheotomized patients was 0.86 percent, while in the intubated group it was 0.92 percent.

The controversy, therefore, is not whether tracheotomy or intubation is the treatment of choice, but rather whether conservative measures with observation is ever indicated in this most unpredictable of infectious disease of the larynx. The choice of establishing the airway should be determined by the availability of adequate facilities in the institution in which the child receives care. A team comprised of a pediatrician, an anesthesiologist and an otolaryngologist is essential in the treatment of a child with epiglottitis.

Establishment of an airway whether by tracheotomy or endotracheal intubation is mandatory in the treatment of this disease. A tracheotomy may be necessary in some children because of difficulties encountered with intubation, or when complications of intubation may have occurred.

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## Freeze-Dried Ear Transplants

FREEZE-DRYING is a useful technique for the preparation and preservation of bone and fibrous tissue transplant parts. There is minimal alteration of the tissue with this procedure. Compelling evidence shows that freeze-dried allograft tissue serves as a reliable template for creeping substitution or replacement by the recipient.

The middle ear transformer mechanism can be reconstructed like-part for like-part with freeze-dried otologic transplants. The advantage of this to the surgeon is the ease of availability of the tissue, which can be stored in small containers in any hospital at room temperature. The simplicity of its use also is attractive. Foreign body extrusion, that has been prevalent with the use of various plastics and metals, is avoided with freezed-dried material.

Freeze-dried dura periosteum, fascia and fibrous tympanic membrane are widely used for the repair of fibrous tissue defects in paratemporal bone lesions.

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## Invasive Radiology In Head and Neck Surgical Operations

RECENT ADVANCES in invasive radiology have added new dimensions to management of vascular lesions of the head and neck. Percutaneous arterial embolization, originally used for thrombosis of arteriovenous malformations, has now been successfully used in the treatment of vascular neoplasms and hemorrhagic disorders. The technique involves the selective catheterization of branches of the carotid system. Major feeding vessels are identified fluoroscopically and carefully embolized using one of various clotting methods.

The preoperative embolization of vascular head and neck tumors such as angiofibromas or chemodectomas has been beneficial in reducing operative blood loss. In addition, this technique has been useful in palliative reduction of vascularity of unresectable lesions.

The control of hemorrhage has proven to be another valuable use for this technique. Duodenal bleeding, posttraumatic pelvic hemorrhage and epistaxis have all been reportedly controlled by arterial embolization.

Many substances have been tried as clotting agents. The safest of these is autologous tissue such as clotted blood or muscle. Other materials include metal filings, absorbable gelatin sponge (Gelfoam®), silicone as liquid or spheres, and polymerizing agents. The most promising technique involves the use of a detachable balloon catheter. Because it can be inflated and deflated before detachment, it offers the opportunity to evaluate changes in flow dynamics and potential

neurological sequelae before irreversible clotting of an arterial vessel occurs.

Fortunately, complications are rare when the procedure is done by an experienced angiographer. The most life-threatening of these is thromboembolism from inadvertent clotting of a normal vessel or retrograde thrombosis from the embolized artery.

The essentials for use of percutaneous arterial embolization appear to be (1) a qualified and competent radiologist, (2) careful selection of cases and (3) strict adherence to details of technique. With these observed, the procedure can be valuable to surgeons dealing with vascular lesions of the head and neck.

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## Use of Carbon Dioxide Laser Technology in Laryngeal and Pharyngeal Surgery

CARBON DIOXIDE LASERS have been developed which, when coupled to microscopes, permit precision removal of superficial lesions in the mouth or larynx. These lasers have a wave length of light which causes them to cauterize or incise any tissue on contact.

This space age technology has the advantage of delivering infrared heat to the target area in precisely controlled amounts. Furthermore, it does so without requiring the placement of a metal blade, such as a Bovie tip, on the area to be treated. This allows the effect on the tissue to be observed at all times. Because the area required for passage of the carbon dioxide laser beam is small, it can be used through modern laryngoscopes which have been designed to permit visualization of the larynx or hypopharynx while using the microscope for both magnification and binocular vision with the appendant depth perception. Furthermore, since the heat cauterizes vessels up to 1 mm in diameter, it is possible to operate in a virtually bloodless field. When larger vessels are encountered they can be cauterized, if necessary, with a conventional Bovie tip.

Carbon dioxide lasers have been in use for several years on the East Coast and now are used for ear, nose and throat procedures at the University of California, San Francisco, for conditions ranging from papilloma of the larynx and leukoplakia of the mouth to superficial cancers of the oral and hypopharyngeal membranes. They also have been used for treating superficial lesions of the cervix and for removing warts on the skin. Consideration is being given to their use in neurosurgery for small lesions, and also in general surgery for bowel papillomas.

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